

NOTES ON THE GREY MULLET (MUGIL SPP.) OF
KRUSADAI ISLAND, GULF OF MANAAR *

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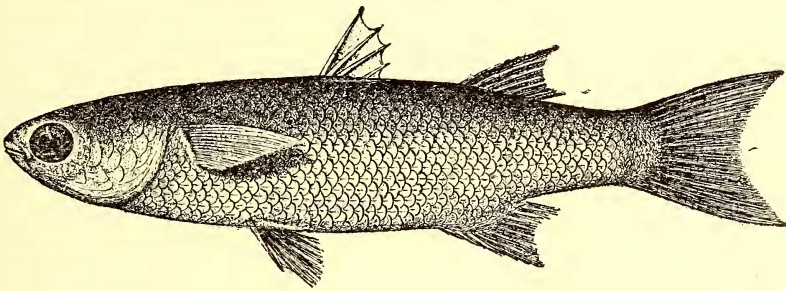
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(With a text figure)

Grey Mulletts (*Mugil* spp.) constitute an important group of fishes hugging the shores of Krusadai and nearby islands in the Gulf of Manaar. The mullet fishery extends throughout the year. The fish is caught in comparatively shallow water at flood tide, with cast and drag nets. The following three species have been found to predominate in the commercial catches:

1. *Mugil troschelii* (Blkr.)
2. *M. waigiensis* (Quoy & Gaim.), and
3. *M. seheli* (Forsk.)



Mugil seheli Forsk.

These species are being studied in detail in view of their importance for cultivation in marine, brackish water and fresh water-farms. In this note are embodied certain details of their bionomics.

Food of Mulletts: The diet of mullets in Krusadai area, as revealed by systematic analyses of 101 specimens of each of the three species, is presented in the following Table I.

The food consists mainly of planktonic organisms. Diatoms formed on an average 65 to 75% of the total volume of the gut contents. The

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TABLE I

Name of species	Size range of fish examined	Gut contents		
		Plankton		Miscellaneous items
		Phytoplankton	Zooplankton	
1. <i>M. troschelti</i>	15 to 37.5 cms.	Diatoms: mainly <i>Thalassiothrix</i> , <i>Pleurosigma</i> , <i>Nitzschia</i> , <i>Coccolodiscus</i> & <i>Navicula</i> ; and algal matter; filamentous algae & <i>Trichodesmium</i> .	Copepods and Polychaete worms	Polychaete moults; foraminiferan shells and sand
2. <i>M. waigiensis</i>	17.5 to 42.5 cms.	Diatoms: mainly <i>Thalassiothrix</i> , <i>Pleurosigma</i> , <i>Nitzschia</i> ; & <i>Coccolodiscus</i> ; and algal matter; <i>Trichodesmium</i>	Crustaceans: Ostracods & Copepods and Polychaete worms	Foraminiferan shells and sand
3. <i>M. seheli</i>	12.5 to 22.5 cms.	Diatoms: mainly <i>Thalassiothrix</i> , <i>Coccolodiscus</i> , <i>Phizosolenia</i> & <i>Nitzschia</i> ; and algal matter; <i>Trichodesmium</i> & filamentous algae	Polychaete worms	Foraminiferan shells and sand.

usual outward appearance of the stomach was slightly greenish. In several instances the stomach and intestines were virtually gorged with diatoms. A large percentage of the *M. waigiensis* examined showed a comparative abundance of the alga *Trichodesmium erythraeum* in the stomach. The presence of foraminiferan shells and sand is suggestive of the possible and occasional browsing habit of mullets at the substratum.

Food of fry of Mulletts: The stomach contents of the fry show that they are surface and mid-water feeders. The analysis of the gut contents is given below in Table II.

TABLE II

Name	No. of specimens examined	Phytoplankton	Zooplankton
Fry of <i>M. troschelli</i>	50	Diatoms : mainly <i>Thalassiothrix</i> , <i>Nitzschia</i> , <i>Pleurosigma</i> , <i>Chaetoceras</i> & <i>Fragillaria</i> Algae : <i>Oscillotaria</i>	Copepods
Fry of <i>M. waigiensis</i>	50	Diatoms : mainly <i>Pleurosigma</i> & <i>Coscinodiscus</i> ; algal filaments and algal spores	Crustaceans : Copepods & <i>Leucifer</i> ; and larval Polychaetes

The fry of *M. troschelli* take to phytoplanktonic diet with great avidity, while those of *M. waigiensis* feed mainly on copepods. The fry of the latter species showed in many cases a selective feeding, as the stomach was frequently noticed to be full of copepods only.

Breeding Seasons: Examinations of gonads in the laboratory revealed that the mullets have a prolonged breeding period from May of one year to February of the succeeding year. Mullet fry are available for collection in the inshore areas of Krusadai Island almost throughout the year.

Characters of Fry: A provisional key for the field identification of eight species of mullets in the Madras waters as classified by Chidambaram and Venkataraman is given by Job and Chacko (1947) in their paper on 'Rearing of saltwater fish in fresh waters of Madras'. The fry of mullets also present certain difficulties in their identification. In view of the fact that the field identification of the fry of mullets

would be of benefit to the pisciculturist, and as the cultivation of mullets in marine and fresh water farms is gaining importance in the country, the need for a key for identification of fry is keenly felt. The distinguishing characters of the fry of *M. troschelii* and *M. waigiensis* are detailed below :

Fry of *M. troschelii*. Dorsal side grey and ventral side silvery ; dorsal and caudal fins spotted ; a dark blotch at the upper edge of the pectoral fin.

Fry of *M. waigiensis*. Exceedingly shiny and silvery all over, except dark margins of the dorsal fins. The pelvic and pectorals tinged yellow. Grey colour first appears on the dorsal side of the head when about 2 cms. in length, and slowly extends to the dorsal side of the body.

Discussion: Devanesen (1942) is of opinion that the fishery of *M. waigiensis* in the Krusadai area depends to a certain extent on the abundant occurrence of the blue green algae *Trichodesmium* spp. in the plankton. Chacko and Venkataraman (1944) made notes on the food of twelve species of mullets in 'our country'. But unfortunately the information regarding the regions from where those specimens of mullet were collected is not given and that restricts the scope of comparison of their data with what is presented in this paper. But on a closer examination of the data furnished by them on the stomach contents of the twelve species, it is noticed that they were collected in the estuaries and backwaters or in the seas close to the mouths of rivers, as evident from the presence of organisms which are characteristic of brackish and fresh waters. Jacob and Krishnamurthy (1948) have given a few more organisms as forming the diet of *M. troschelii* and *M. waigiensis* than those recorded by Chacko and Venkataraman (1944). Chacko (1949), presenting the food and feeding habits of the fishes of the Gulf of Manaar has recorded the gut contents of *M. troschelii*, *M. waigiensis* and *M. seheli*. In addition to the previous records of the stomach contents of the three species of *Mugil*, the following organisms have been observed in the course of this study.

1. *M. troschelli* — *Trichodesmium* sp. & copepods.
2. *M. waigiensis* — (No new records)
3. *M. seheli* — Foraminiferan shells.

Chacko (1949) suggests that *M. seheli* is a plankton feeder, but it has been observed by us that this species resorts to occasional bottom feeding also, like the other two. The sand and bottom scum are found in the stomach contents of *M. troschelii* in the Krusadai area, but apparently not in Ennore region. The phytoplanktonic organisms of brackish water origin as recorded by the other investigators are not found included in the stomach contents of the three species under examination at Krusadai. Our observations, in general, on the feeding habits of mullets confirm those of the previous workers regarding their planktonic diet and their occasional feeding at the bottom. Regarding the food of mullet fry, Jacob and Krishnamurthi (1948) state that the fry of mullets of Ennore share all the adult characters in their type of food and manner of feeding. The analyses presented above for the Krusadai area show a conspicuous absence of foraminiferan shells and sand grains.

There is hence every reason to believe that only full-grown mullets resort to occasional browsing at the substratum.

According to Jacob and Krishnamurthy (1948) 'the mullets of Madras coast breed soon after the commencement of the monsoon' and they have observed the gonads to be ripe from October to May. This indicates that the stimuli for breeding may be certain factors including perhaps those caused by the monsoon. The factors may possibly be physical, like temperature, wind and current; chemical, like salinity and oxygen content; and physiological, like availability of food (diatoms mainly). This aspect is under further investigation and the findings will be presented separately.

S u m m a r y : Grey mullets constitute an important group of fishes hugging the shores of Krusadai and nearby islands in the Gulf of Manaar. The three important species constituting the fishery are (1) *M. troschelii* (Blkr.), (2) *M. waigiensis* (Quoy and Gaim.) and (3) *M. seheli* (Forsk). The food of the adult and fry of the first two species are presented and discussed. The characters for identifying in the field the fry of *M. troschelii* and *M. waigiensis* are given in view of their importance for pisciculturists, since the cultivation of mullets in marine and fresh water farms is gaining more importance in this country than ever before.

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